We claim:

CLAIMS

1. A data storage apparatus comprising:

a read head for reading magnetic data from a recorded portion of a recording layer of a perpendicularly recorded magnetic medium;

a stabilizer for magnetically stabilizing a portion of an underlayer of the magnetic medium directly below the recorded portion simultaneously while the read head is reading said magnetic data from the recorded portion; and

the read head and the stabilizer being separate structures.

2. A data storage apparatus as claimed in claim 1 wherein the stabilizer includes:

first and second elongated probes and a bridge with the bridge interconnecting the first and second probes; and

the read head being located between the first and second probes.

3. A data storage apparatus as claimed in claim 1 further comprising:

the read head having a head surface which defines a head surface plane;

the first probe being closer to the read head than the second probe; and

the first probe being recessed from the head surface plane and the second probe being coextensive with the head surface plane.

4. A data storage apparatus as claimed in claim 3 wherein the first probe increases in magnetic material volume as it extends toward the head surface.

5. A data storage apparatus as claimed in claim 1 further comprising:

biasing means for applying a constant bias field to the stabilizer.

6. A data storage apparatus as claimed in claim 5 wherein the constant bias field is greater than two (2) times the magnetic coercivity of the soft underlayer.

7. A data storage apparatus as claimed in claim 1 further comprising:

a write head which has first and second pole pieces; and

one of the first and second probes and one of the first and second pole pieces being a common component.

8. A data storage apparatus as claimed in claim 7 wherein the stabilizer includes:

first and second elongated probes and a bridge with the bridge interconnecting the first and second probes; and

the read head being located between the first and second probes.

9. A data storage apparatus as claimed in claim 8 further comprising:

the read head having a head surface which defines a head surface plane;

the first probe being closer to the read head than the second probe; and

the first probe being recessed from the head surface plane and the second probe being coextensive with the head surface plane.

10. A data storage apparatus as claimed in claim 9 wherein the first probe increases in magnetic material volume as it extends toward the head surface.

11. A data storage apparatus as claimed in claim 10 further comprising:

biasing means for applying a constant bias field to the stabilizer.

12. A data storage apparatus as claimed in claim 11 wherein the constant bias field is greater than two (2) times the magnetic coercivity of the soft underlayer.

13. A data storage apparatus as claimed in claim 12 wherein the read head comprises;

nonmagnetic first and second read gap layers;

a sensor located between the first and second read gap layers;

ferromagnetic first and second shield layers; and

the first and second read gap layers being located between the first and second shield layers.

14. A data storage apparatus as claimed in claim 1 further comprising:

a write head; and

in addition to the read head being located between the first and second probes, the write head also being located between the first and second probes.

15. A data storage apparatus as claimed in claim 14 wherein the stabilizer includes:

first and second elongated probes and a bridge with the bridge interconnecting the first and second probes; and

the read head being located between the first and second probes.

16. A data storage apparatus as claimed in claim 15 further comprising:

the read head having a head surface which defines a head surface plane;

the first probe being closer to the read head than the second probe; and

the first probe being recessed from the head surface plane and the second probe being coextensive with the head surface plane.

17. A data storage apparatus as claimed in claim 16 wherein the first probe increases in magnetic material volume as it extends toward the head surface.

18. A data storage apparatus as claimed in claim 17 further comprising:

biasing means for applying a constant bias field to the stabilizer.

19. A data storage apparatus as claimed in claim 18 wherein the constant bias field is greater than two (2) times the magnetic coercivity of the soft underlayer.

20. A data storage apparatus as claimed in claim 19 wherein the read head comprises;

nonmagnetic first and second read gap layers;

a sensor located between the first and second read gap layers;

ferromagnetic first and second shield layers; and

the first and second read gap layers being located between the first and second shield layers.

21. A method of making a data storage apparatus comprising the steps of:

forming a read head for reading magnetic data from a recorded portion of a recording layer of a perpendicularly recorded magnetic medium;

forming a stabilizer for magnetically stabilizing a portion of an underlayer of the magnetic medium directly below the recorded portion simultaneously while the read head is reading said magnetic data from the recorded portion; and

forming the read head and the stabilizer as separate structures.

22. A method as claimed in claim 21 wherein the method further comprises the steps of:

providing the stabilizer with first and second elongated probes and a bridge wherein the bridge interconnects the first and second probes; and

locating the read head between the first and second probes.

23. A method as claimed in claim 22 wherein the method further comprises the steps of:

providing the read head having a head surface which defines a head surface plane;

locating the first probe closer to the read head than the second probe; and

recessing the first probe from the head surface plane and making the second probe coextensive with the head surface plane.

24. A method as claimed in claim 23 wherein the method further comprises the step of:

applying a constant bias field to the stabilizer.

25. A method as claimed in claim 24 wherein the constant bias field is formed greater than two (2) times the magnetic coercivity of the soft underlayer.

26. A method as claimed in claim 21 wherein the method further comprises the steps of:

providing a write head; and

in addition to locating the read head between the first and second probes, also locating the write head between the first and second probes.

27. A method as claimed in claim 26 wherein the method further comprises the steps of:

providing the stabilizer with first and second elongated probes and a bridge wherein the bridge interconnects the first and second probes; and

locating the read head between the first and second probes.

28. A method as claimed in claim 27 wherein the method further comprises the steps of:

providing the read head having a head surface which defines a head surface plane;

locating the first probe closer to the read head than the second probe; and

recessing the first probe from the head surface plane and making the second probe coextensive with the head surface plane.

29. A method as claimed in claim 28 wherein the method further comprises the step of:

applying a constant bias field to the stabilizer.

30. A method as claimed in claim 29 wherein the constant bias field is formed greater than two (2) times the magnetic coercivity of the soft underlayer.

31. A method of suppressing noise while reading from a perpendicular recorded medium comprising the steps of:

employing a read head for reading a recorded portion of a top recording layer; and

simultaneously with said reading, employing a stabilizer, which is separate from the read head, for introducing a field into a portion of a bottom underlayer directly below the recorded portion with sufficient strength to stabilize said portion of the bottom underlayer in a single domain state.